

# Requirements for learning scenario and learning process analytics

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[http://edutechwiki.unige.ch/en/Learning\\_process\\_analytics](http://edutechwiki.unige.ch/en/Learning_process_analytics)

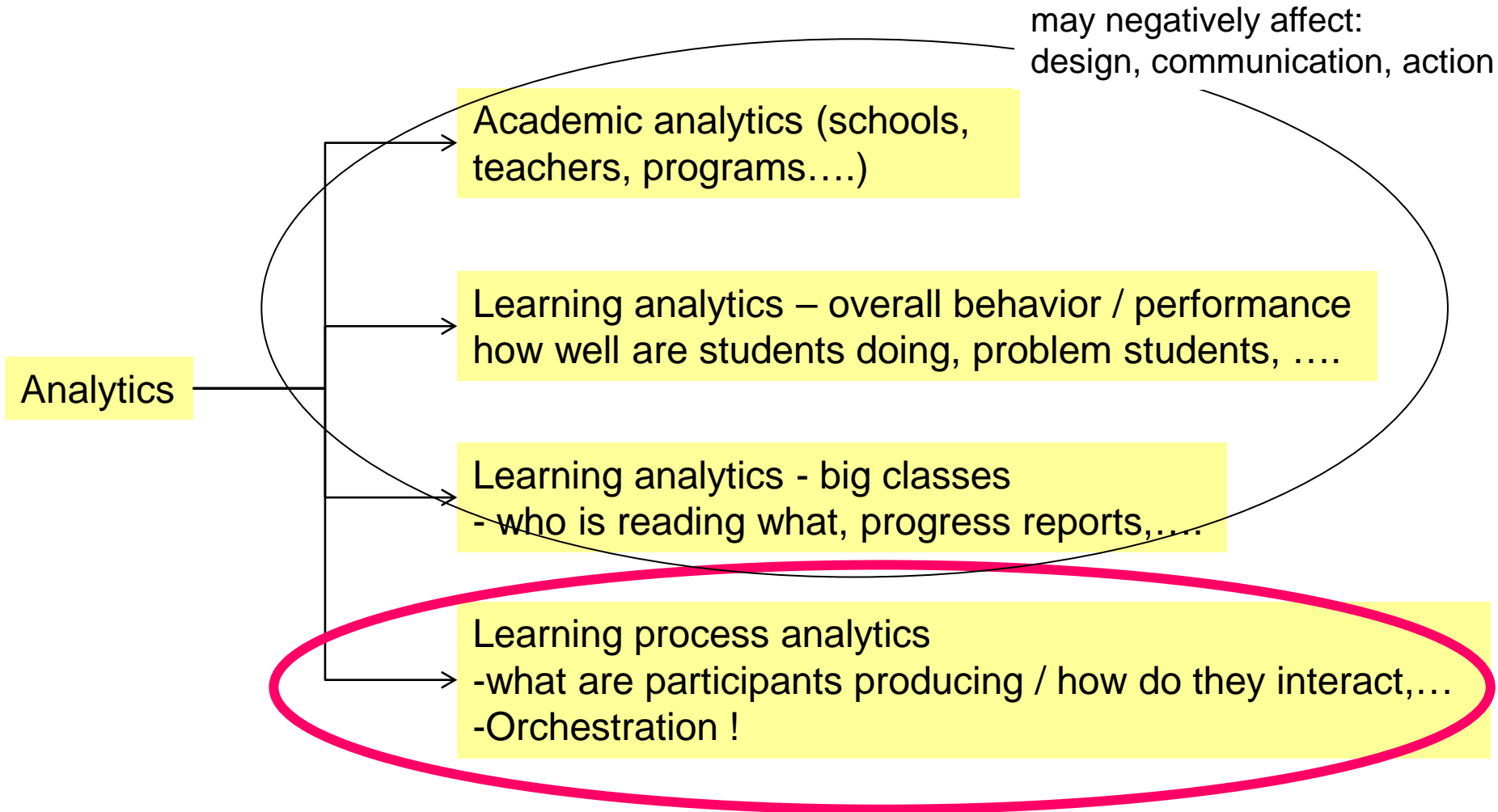


28.06.2012

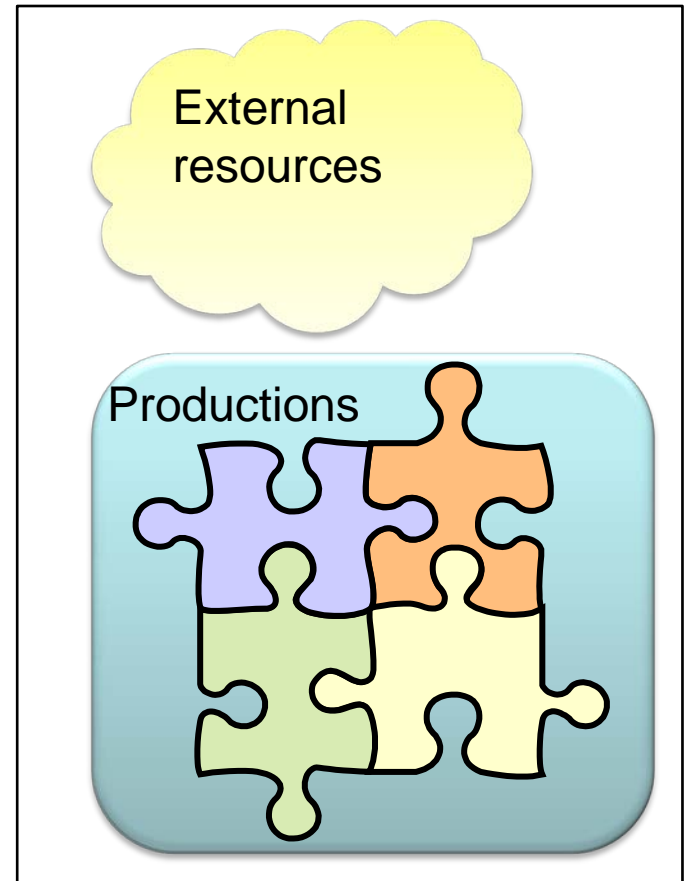
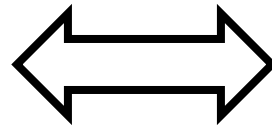
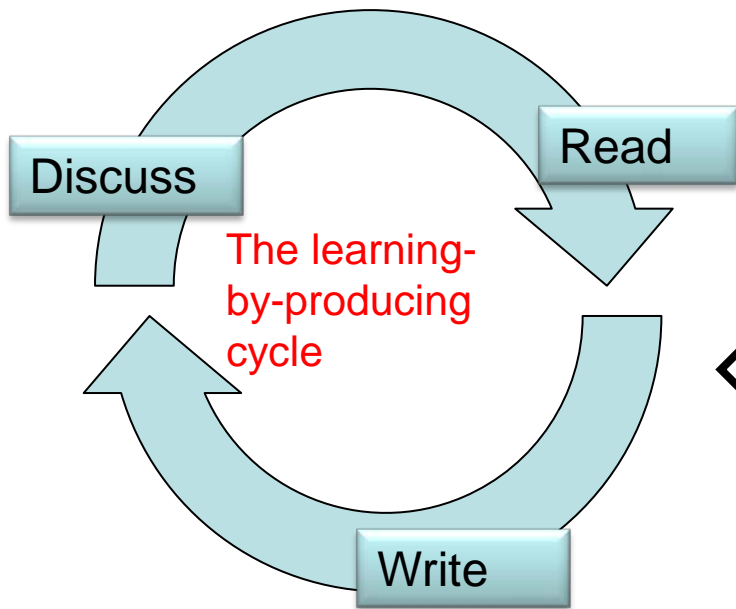
<http://edutechwiki.unige.ch/en/>



# Learning analytics: Kinds ....



# Project-oriented learning: the bottom line



**Learning**

# Project-oriented learning: variants & the common problem

Includes:

inquiry-based learning

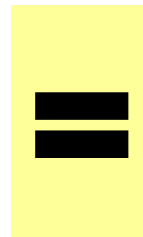
problem-based learning

project-based learning

project-methodology-based learning

case-based learning

.....

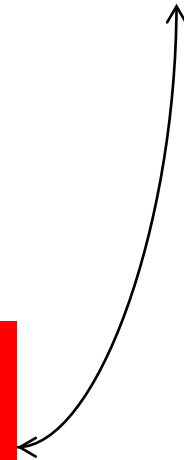


Pedagogies  
Scenarios  
Environments



What's going on ??

What Inter(actions) + Productions  
(both teachers and learners should know)



# What do we have ?

```
graph TD; A[What do we have ?] --> B[Good analytics for systems that are not used (EdTech research)]; A --> C[Some tools for technology that people do use (mostly hacks)]; A --> D["(Difficult) data mining and analysis tools"]; A --> E[Main stream "where"-type analytics];
```

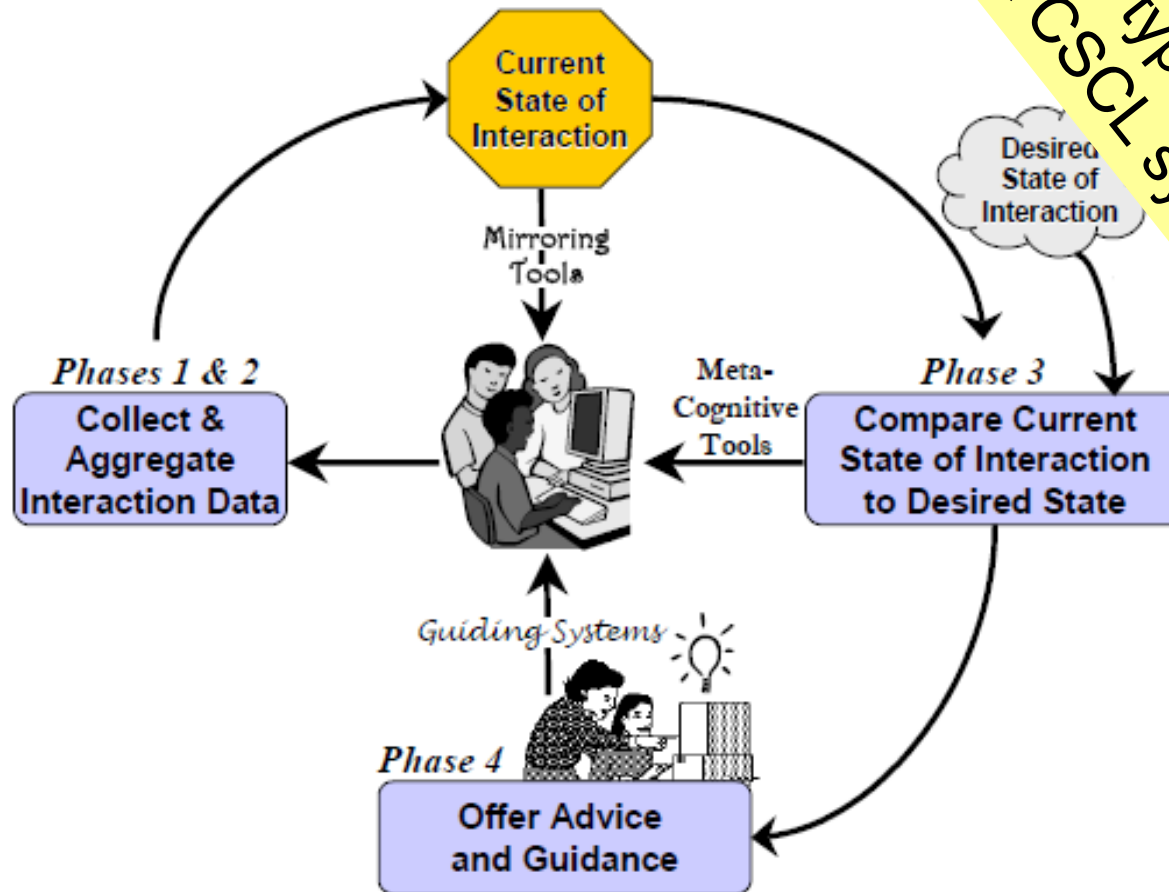
Good analytics for systems that are not used (EdTech research)

Some tools for technology that people do use (mostly hacks)

(Difficult) data mining and analysis tools

Main stream "where"-type analytics

# Good analytics - CSCL



Soller, MartinezJermann, & Muehlenbrock (2005). From Mirroring to Guiding: A Review of State of the Art Technology for Supporting Collaborative Learning

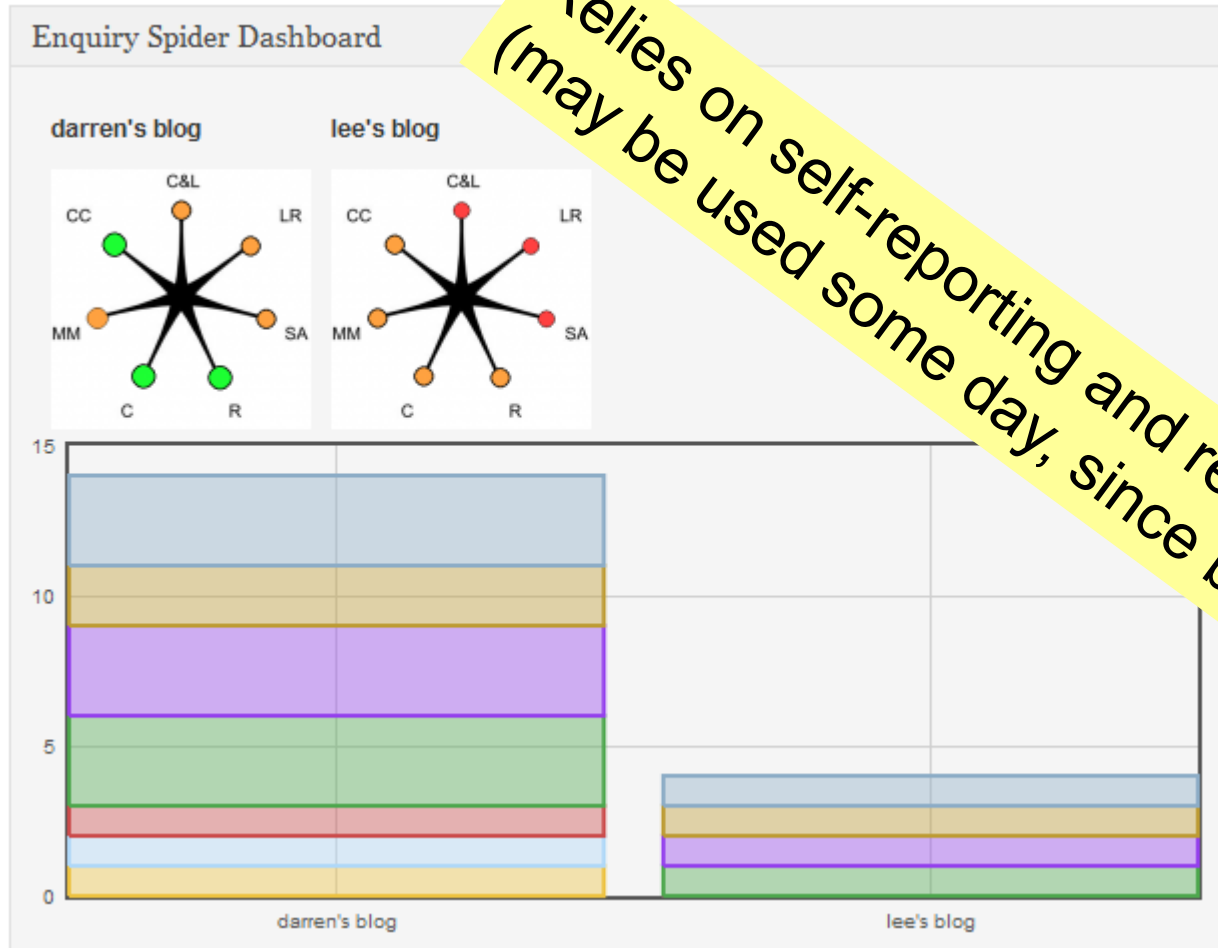
# Good analytics – Knowledge construction kits

The screenshot displays a Knowledge Forum window titled "Organic nomenclature and Isomerism". The main text area contains a problem statement: "How the word 'symmetrical' is defined? The different physical properties of isomers depend on the difference in their symmetry right? But often I get confused about which of the isomers is more symmetrical and has higher packing efficiency. For example, ClC(Cl)=C this is symmetrical in a way, isn't it?". A chemical structure of trans-1,2-dichloroethene is shown below the text. A list of "My actions" is visible on the left, including "need to understand", "New information", "This theory cannot explain", "A better theory", "Putting our knowledge together", "Synthesis", "Chemical equation", "My argument", "My analysis", "My conclusion", and "Cutting edge". A "Scaffold supports" box is located at the bottom left. A "Problems of understanding" box is positioned at the top right of the text area. The interface includes a menu bar with options like "View", "New Note", "Connections", "My Reader", "Display tool", "Search", and "Media".

designed for building and interaction  
(not used)

CSILE/[Knowledge Forum](#) (Scardamalia & Bereiter,)

# OK analytics – Enquiry blog builder




Relies on self-reporting and requires some setup skills  
(may be used some day, since blogs are fairly easy)

[Ferguson, Buckingham Shum, and Crick \(2011\)](#)



# OK analytics – StatMediaWiki

Low 

| #  | User                             | Edits | %     | Edits in articles | %     | Bytes  | %     | Edits in templates | %     | Uploads | % |
|----|----------------------------------|-------|-------|-------------------|-------|--------|-------|--------------------|-------|---------|---|
| 1  | 17005286d90dc461c8354b5ef0e22134 | 833   | 28.5% | 335               | 18.2% | 313577 | 16.8% | 26                 | 15.5% |         |   |
| 2  | 39ff2b802d2e2e6d6640bec6c59af74e | 588   | 20.1% | 354               | 19.2% | 91158  | 9.3%  | 15                 | 8.9%  |         |   |
| 3  | eb0028b47e6bf30879fefbc9c9f0d4e6 | 339   | 11.6% | 323               | 17.5% | 48855  | 5.2%  | 5                  | 3.0%  |         |   |
| 4  | f7718a5b24933e0e1f0bbb5dcb1d479a | 184   | 6.3%  | 132               | 7.2%  | 52481  | 5.5%  | 31                 | 18.5% |         |   |
| 5  | 7fb6f2ee2b017ed28a3f2b2da1725633 | 171   | 5.9%  | 88                | 4.8%  | 60845  | 6.4%  | 26                 | 15.5% |         |   |
| 6  | 245b1c8f9d39bbab5e19d97a21a3ecec | 134   | 4.6%  | 77                | 4.2%  | 73053  | 7.7%  | 20                 | 11.9% |         |   |
| 7  | 0fd57e19597dcbcb1c548352491da91d | 133   | 4.6%  | 122               | 6.6%  | 49644  | 5.2%  | 6                  | 3.6%  |         |   |
| 8  | 8ded3d9f5d47d04e9fbb2b7ff4a453ea | 114   | 3.9%  | 114               | 6.2%  | 59655  | 6.3%  | 596                | 0.0%  |         |   |
| 9  | a78ed7c3449a79693661813601fa8aed | 85    | 2.9%  | 71                | 3.9%  | 47367  | 5.0%  | 45383              | 6.0%  |         |   |
| 10 | f879d1a068fbff29bc1d2a68e4644c1e | 72    | 2.5%  | 48                | 2.6%  | 13367  | 1.4%  | 7736               | 1.2%  |         |   |
| 11 | a7279dac615c2ebf72728e303f016ebe | 59    | 2.0%  | 25                | 1.4%  | 22524  | 2.4%  | 14125              | 1.9%  |         |   |
| 12 | 9f32496dc28b6793f58c6c6810cbcd2e | 30    | 1.0%  | 29                | 1.6%  | 24392  | 2.6%  | 24392              | 0.0%  |         |   |
| 13 | 1e74b2469e4cf2e6ccb2dd71cecada16 | 29    | 1.0%  | 29                | 1.6%  | 2958   | 0.3%  | 2958               | 0.0%  |         |   |
| 14 | 7a5940ea0373cb3157b52bd0dee9b436 | 23    | 0.8%  | 23                | 1.2%  | 3310   | 0.3%  | 3310               | 0.5%  |         |   |
| 15 | 7db12a5d9eab23eb4e5e395d31610468 | 19    | 0.7%  | 8                 | 0.4%  | 12465  | 1.3%  | 12335              | 1.9%  |         |   |
| 16 | 349b973f6e82f54d3fcec52625854898 | 17    | 0.6%  | 10                | 0.5%  | 6605   | 0.7%  | 299                | 0.0%  |         |   |
| 17 | 66ec43187d9ce19e6c2fa25040aee0a6 | 13    | 0.4%  | 2                 | 0.1%  | 9416   | 1.0%  | 2152               | 0.3%  |         |   |
| 18 | f8fd58307448f8bb4cd14ccffa1fbcef | 12    | 0.4%  | 8                 | 0.4%  | 1507   | 0.2%  | 815                | 0.1%  | 0       |   |
| 19 | 1a10307dcbc929864b9880ea8869e011 | 10    | 0.3%  | 10                | 0.5%  | 33739  | 3.6%  | 33739              | 5.2%  | 0       |   |
| 20 | 48658ee1bde625c8de92d64a90becb66 | 8     | 0.3%  | 5                 | 0.3%  | 5204   | 0.5%  | 3970               | 0.6%  | 0       |   |

Nice tool, but buggy and unfinished  
 – typical of most EU research  
 May be used, but Wiki-designs are hard

Rodríguez-Posada et al., 2011

# OK analytics – Project tools

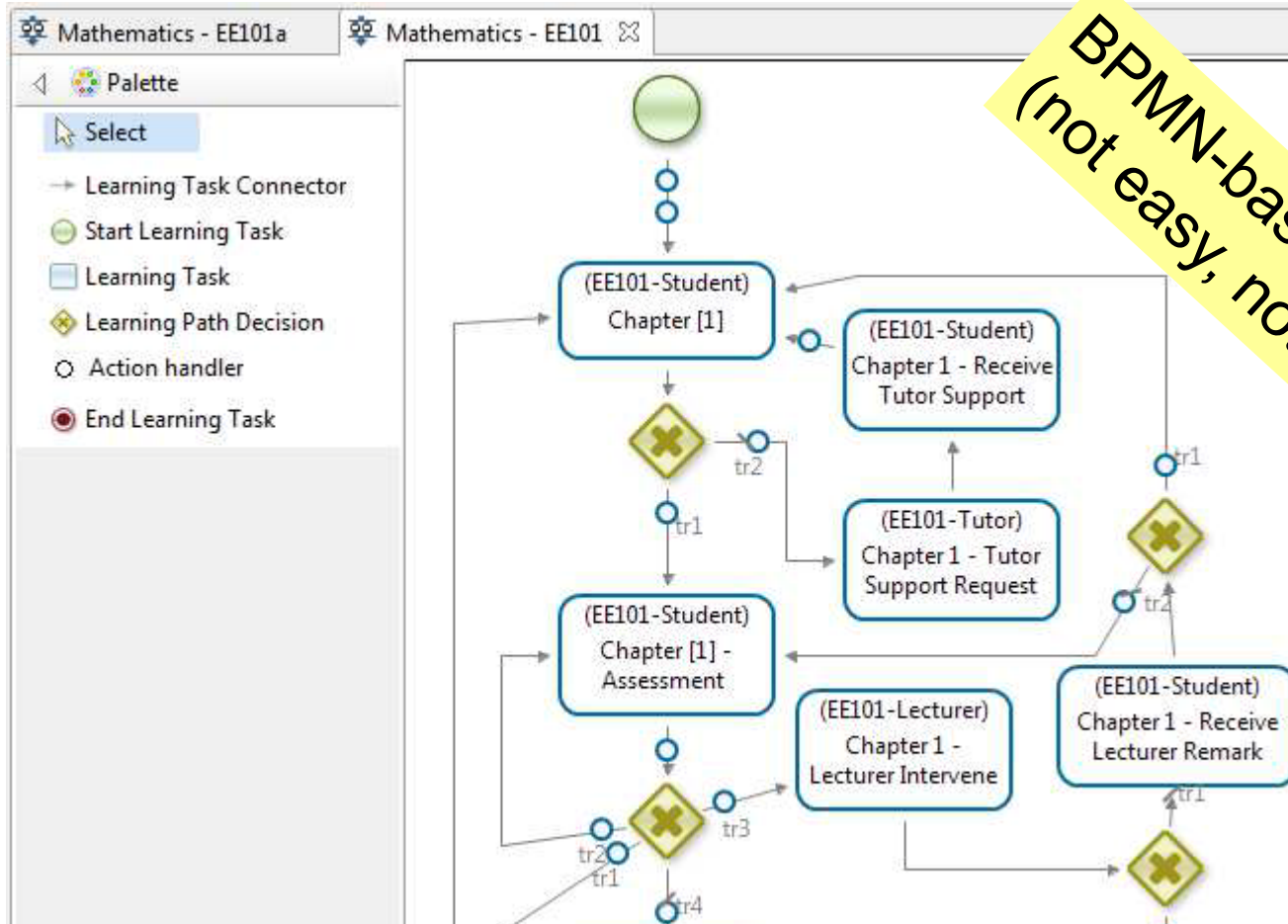
The screenshot displays the Pivotal Tracker interface for a project named 'ChemWriter'. The interface is divided into several sections:

- Current:** A list of tasks for the current sprint, including 'Launch chemwriter.com demo page', 'Create chemwriter.com demo page (RA)', 'Dialogs float over entire editor area (RLA)', 'Menu model (RLA)', 'MenuView Skeleton (RLA)', 'MolfileWriter#writePropertiesBlock\_fails when compiled (RLA)', 'Menu controller (RLA)', 'Action (RLA)', 'About Action (RLA)', 'Integrate view molfile into dock (RA)', 'Clicking on bond with ring tool fuses ring to bond. (RLA)', 'Canvas hit detection doesn't scroll when page scrolled (RA)', 'Display molfile (RLA)', 'Create abstract dialog class (RA)', 'Display molfile action (RA)', 'Dock', 'Dragging atom to another atom fuses it. (RLA)', and 'Disable atom/bond hover while dragging (RLA)'. The sprint is dated '11 15 Nov - Current' and has '16 of 18' points.
- Icebox:** A list of tasks that are not currently in the sprint, including 'Find out how to efficiently calculate pageOffset\_ when scrolling document.', 'Import molfile', 'Copy/Paste', 'Shorten bond to source/target.', 'Zoom in/out', 'Center nag', 'License file genera...', 'Compiled editor knows its g...', 'revision', 'Extend VML/SVG graphics with #drawLine function', 'File patch for Closure VML negative coord size bug.', 'Function to generate series of angles in chemwriter.math', and 'Replace chemwriter.math.Point'. The sprint is dated '13 29 Nov' and has '1' point.

At the bottom of the interface, there is a copyright notice: '© 2010 Pivotal Labs / Policies / Feedback'.

Not made for education, agile development must be learned  
(may be used in engineering education)

# OK analytics – workflow systems



BPMN-based prototype  
(not easy, not fully mature)

Virtual Learning Process Environment (VLPE), Adesina and Molloy (2012)

# Conclusion : Needs and avenues



Dimensions:

- Productions
- Interactions
- Reflections
- Management and regulation

Tomorrow

- Portfolio/PLE Task mgmt. tools
- Collaboration graphs etc.
- Self-reporting tools & cockpits
- Teacher Dashboard

Later

- SOA kits with APIs that can summarize
- Collaboration "graphs" across systems
- Integration with competence development
- General-purpose monitoring and tutoring tools

<http://edutechwiki.unige.ch/en>

[http://edutechwiki.unige.ch/en/Learning\\_process\\_analytics](http://edutechwiki.unige.ch/en/Learning_process_analytics)  
(wiki version of the EdMedia paper)

Questions ?  
Other topics to discuss ?